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AUTHOR Marullo, Sam, Jr.; Dreger, Ralph Mason
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ABSTRACT

For two decades the Behavioral Classification Project (BCP) has been developing instruments of a behavioral nature for the classification of emotional disorders and the classification of persons with specified patterns of emotional disorders. The BCP has four subprojects: the Pre-school Behavioral Classification Project (PBCP), the Children's Behavioral Classification Project (CBCP), the Adolescent BCP, and now the Adult Behavioral Classification Project (AdBCP). The AdBCP instrument closely parallels previous BCP instruments. It is based on the Adolescent BCP and is the result of a 19-member team devising behavioral items to include the full scope of adult mental and emotional disorders. The instrument was administered to clinical and nonclinical subjects. Seven of 24 factors are described; tables indicate distinct patterns for the different diagnostic groups. However, the comparisons have not been thoroughly analyzed, partly because standard scores necessary to make direct comparisons have not yet been developed. Comparisons can, however, be made from the raw score means and standard deviations across the rows for the factors. (Author/PN)

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An Extension of the Behavioral Classification Project Upward to Adults

Sam Marullo, Jr. and Ralph Mason Dreger

For well over two decades now the Behavioral Classification Project has been developing instruments of a behavioral nature for the classification of emotional disorders and the classification of persons with specified patterns of emotional disorders. Recently the second author of this paper has presented a history of attempts at behavioral classification going back to 1924. The first of the articles of this review has been published in Clinical Psychological Review. The second taking the review up through 1980 and 1981 will appear in an issue shortly to be published. Rather than attempting such a history at the beginning of this paper we shall merely refer you to Clinical Psychology Review.

The Behavioral Classification Project has four subprojects so far, beginning with the Pre-school Behavioral Classification Project, the PBCP, the Children's Behavioral Classification Project, CBCP, the Adolescent BCP, and now the Adult Behavioral Classification Project or the AdBCP. Behavioral refers to items describing behavior that is observable at the level of "Johnny pick up a stick and hit Mary" in contrast to the level of "Johnny was naughty." The "Grand" scheme of the Behavioral Classification Project can be described by the following steps: (1) Gathering of accurate and comprehensive behavior descriptions and concomitant behavior settings descriptions, (2) Application of the obtained descriptions to representative samples of specified populations, (3) Determination of interrelations of behavioral descriptions

leading to basic dimensions of disorder, (4) Determination of patterns of dimensions of individuals, leading to a classification system not only of problems or disorders, but of persons, (5) Application of classification system to new samples both with and without differential classification on other bases, (6) Controlled selective therapy with system-differentiated individuals, leading to predictive procedures, (7) Application of therapeutic predictions to new samples, (8) Continued critical analysis of the diagnostic-therapeutic system, (9) Assessment of ediology, leading to prevention, in turn leading to the elimination of the need for a diagnostic-therapeutic system.

We recognize fully the ideal nature of such a grand scheme. Nevertheless, that scheme has been the background of our endeavors across 23 years.

The general method which we have used to try to fulfill that scheme has been, first, to assemble as large a pool of behavioral items as to cover all of the realms of disordered behavior as well as major positive behaviors indicative of adjusted and wholesome living. We have then applied factor analytic methods to endeavor to reduce the congeries of behavioral statements to a set of dimensions which can be more easily manipulated. Following the identification of a number of dimensions in the case of each of the subprojects, we have endeavored to find concomitants to these dimensions from external sources. Then more laterally, we have applied cluster-analytic methods to the profiles of individuals on the factorially derived dimensions. Only in the Children's Behavioral Classification Project have we been able to reach this ~~latter~~ stage of clustering children on the basis of their

behavioral dimension profiles. In the present instance, with the AdBCP, we have only been able to establish initially certain of the dimensions which we anticipate will be the firm dimensions for adults from 18 to 65. In each previous case, however, for the PBCP, the CBCP, and the ABCP, we have developed from 18 to 26 factors or dimensions; now we have the AdBCP 18 scored dimensions. These relatively large numbers of dimensions stand in contrast to the fewer dimensions, anywhere from 2 to 8 or 9, which are found in most classification systems. If you wish to read of the rationale for the larger number of dimensions in the Behavioral Classification Project as compared to others, you can look up the article by the second author on "First-, Second-, and Third-Order Factors, from the Children's Behavioral Classification Project Instrument and an attempt of rapprochment" which is found in last June's Journal of Abnormal Psychology. Now let us turn to the Adult Behavioral Classification Project and the development of the instrument for it.

Method

Procedure

The development of the AdBCP instrument closely parallels that of previous BCP instruments. The item pool which resulted in 536 items in the present form of the AdBCP instrument came from two sources. One source was items from the adolescent instrument which would be appropriate for the adult level according to clinical judges. Over 350 items from the ABCP instruments were included in the initial item pool. Since there has regularly been an overlapping of items from one age level to the other, the use of the closest age range for inclusion of items achieves a degree of commonality between the ABCP instrument and the AdBCP instrument.

The second source of items resulted from the work of a 19-member interdisciplinary, cross-sex, interracial team which worked up behavioral items to cover three major areas, in turn divided into 64 subareas, 16 of which were subdivided further to include the full scope of adult mental and emotional disorders. The three major areas are: (1) biological functioning including sensory and motor manifestations, (2) temperament and social effectiveness and (3) learning, vocation, avocation, anomic practices, and philosophy of life. This last category is admittedly a catch-all to assure inclusiveness, rather than a logical category comparable to the first two. The team members were instructed to write items to describe actually observable behaviors, whatever could be seen, heard or smelled that would prompt someone to judge that the individual has a problem. All items were to be descriptions of behavior and not be dependent on inference or judgment by the observer except those perceptual judgments which are made in all of our perception. Socially desirable or "positive" items were also elicited. Approximately 1300 items resulted from the combination from previously-used and newly-generated statements. This number was reduced to 536 items by the process of eliminating, first, non-behavioral items, then duplicates or very similar items, and finally by elimination of items from those areas and subareas in which an excess of items existed. A panel of four judges was utilized in this elimination process. Approximately 1/10th of the retained items are "positive," in keeping with the procedure of other BCP instruments. Of the final 536 items, 165 are from the adolescent form of the BCP instruments with a few of these items slightly modified to augment their appropriateness for adults.

Although experience with previous BCP instruments has shown that demographic and other personal history data items align into factors separate from behavioral items, the AdBCP instrument in this initial standardization does include the demographic and personal history variables of age, sex, race, clinic- nonclinic status, and educational level. Thus the total number of variables is 541. The 536 behavioral items were randomized and organized into a true-false questionnaire format. A National Computer Systems MMPI answer sheet ~~form~~ was used with a separate form for demographic and personal history data. Specific instructions were included with each instrument. Subjects who could not read or could not read at the level of the items were administered the instrument individually or in small groups with close monitoring.

Subjects

In order to maximize the variability of the behavioral domain sample, the instrument was administered to both clinical and non-clinical subjects from a variety of sources. Clinic subjects were defined as any persons seeking professional help for psychological problems from a member of the helping professions, social work, psychology, or psychiatry, in a public or private in-patient or out-patient facility. Characteristics of subjects are presented in Tables 1 and 2. In Table 1, it can be seen that the protocols derived from self-report exceed considerably those derived from other respondents with respect to the subject. The rationale for the final grouping together of both self and other responses is that at the level of behavior if someone, either the individual himself or herself or a close observer, reports behavior concerning that individual it is data for such an individual. In the analyses

then, the two groups of responses are lumped together. It can also be seen from Table 1 that the sources are quite varied for clinical subjects. Of the nonclinical subjects, those from universities or colleges were students earning course credit for completing the instrument. A careful screening of protocols from both sets of subjects for random responding, position responding, or other forms of carelessness brought the total of acceptable protocols to 615.

Diagnostic information was obtained on many of the subjects who comprised the clinical group. The six major diagnostic groups and one unknown diagnosis group are described in Table 4.

Analysis

The completed protocols were entered into a principal components analysis using the Vand 500 program which can handle 500 variables. Only one item was omitted from the initial analysis because of its extremely low endorsement rate, one out of 615. There is here an important methodological point. If all items with low frequency of endorsement are eliminated, then some of the most important and pathognomonic variables are taken away, as has beeen the case with a number of behavioral instruments. Very disproportionate proportions like, for example, .03 to .97 and the resulting lack of homoscedasticity should by some statistical standards vitiate the correlations which serve as a basis for factor analysis or component analysis as in this case. However, from the 20 years experience and more that we have had with such items, we have found them loading on factors in appropriate fashion regardless of their great disproportions.

Thus, only the one item was eliminated on account of low

frequency of endorsement. Because of the 540 remaining variables, 535 behavioral items plus 5 demographic and personal history variables, exceeds the 500-variable capacity of the program, two overlapping analyses were done. First, variables 1 through 500 were run and 30 retained components rotated first orthoganilly by the Varimax procedure and then obliquely by the Promax procedure. Then a second run with variables 41 through 540 was done with the identical procedure. From inspection of the factor structure of both sets of factors a number of items were eliminated. All items whose highest correlation with any factor was .30 or below were eliminated with the exception of 23 items that were deamed to be clinically important to a degree which warranted their inclusion. However, 48 items altogether were eliminated because of low correlations with factors; other items were eliminated for substantive reasons, for example, applying only to a small segment of the total population but not being necessarily pathognomonic. One of these, for instance, is "Even though he/she has lost a leg or an arm complains of pain in a lost limb." The total number of items dropped was 51.

The remaining 490 variables were then reanalyzed and 30 factors retained in accord with previous analysis of BCP instruments. These were rotated first orthogonally then obliquely to the best simple structure fit as determined by the hyperplane count proportions.

Factor scores, including means and standard deviations, were generated for 18 of the 30 oblique factors. Scoring weights consisted of the factor structure coefficients. These were assigned on the basis of utilizing the highest loading of a variable on a

particular factor to give to that factor but to no other factor. Thus a particular variable was assigned to only one factor. Items used for scoring factors are, therefore, a subset of the total set of items used for purposes of identification of a factor. In several cases in order to balance out the numbers of variables assigned to some factors, a near-highest weight was assigned rather than the highest weight.

Results

The orthogonal rotation procedure yielded a .720 proportion in the hyperplane, while the oblique rotation procedure yielded a .922 proportion in the hyperplane. The oblique solution was chosen, therefore, as the procedure yielding the better degree of fit. Of the 30 factors generated, 24 were retained and interpreted. The names of these interpreted factors are seen in Table 3. Identification of factors was accomplished by listing those items which correlated highest with that factor in rank order of correlation coefficients from high positive to high negative. Although a rigid cutoff point was not set generally, only items which correlated above .30 were considered as identifying items for a factor. The 30 factors are labelled A to Z and AA through AD. However, as can be seen from Table 3, 6 of the factors are not interpreted because no items correlated above .30 with the factors. Eighteen of the 24 factors were scored which were judged to be the strongest in the sense of having a larger number of item variables with higher factor weights. Table 4 gives the means and standard deviations of the factor scores of the major diagnostic groups utilized for external identification of the 18 factors.

In the time available, description of the separate factors

has to be confined to just a few.

Factor A - General Psychopathology - is not scored for our purposes here because it appears to be comparable to Lovick Miller's General Psychopathology factor which he partials out of the factors derived from the Louisville Behavior Check List. It consists of so many items indicating this general psychopathology that it does not appear to be discriminating, and therefore, for purposes of external identification with different diagnostic groups would supposedly not help in such identification. However, it will be necessary for us to pursue that supposition to determine whether it is true or not. Factor B - Aggressive Misanthropic Maladjustment - has as its highest scored items "Has been in trouble with the law" "People say he/she spends money like water, 'money burns holes in his/her pockets'" "Passes out or blacks out or gets the shakes from drinking" "Does not have any sort of living place," "Has been caught driving while drunk by the police or has been arrested for possession of drugs" and "Has been fired from more than one job."

The Positive Social Orientation - Factor C - brings together just about all of the socially desirable items in the instrument like "Others say he/she sets a good example" "Expresses delight over the happiness or good fortune of others" and "Other people appear to listen to what he/she says."

Some of the items identifying Factor I - Apathetic Dependent Psychosis - are "Speaks far more slowly than others" "Has missed a lot of work on account of illness" "People report that he/she sits like a bump on a log and doesn't ever say anything" "Tells others that he/she hears noises no one else hears" "Says over and over

that he/she has committed a sin which cannot be forgiven" "Claims that some kind of machine or rays of voices are making him/her do things" "Says he/she feels electricity in his/her body" "Complains that most food and drink are tasteless."

Manic Impulsivity - Factor P - is scored on such items as "Plays dangerous sports or has hobbies that are 'risky business'" "People say that he/she changes his/her mind a lot" "Goes to the toilet in places other than the bathroom or restroom" "Tells others 'I like to do a lot of different things in having sex; not just the same old thing.'"

As might be expected, Factor V - Overt Aggression - includes such items as "Carries weapons in his/her car or on his/her person" "Has been arrested for assault or other violent acts" "Carries weapons such as knives, brass knuckles, chains, clubs or things like that" "Others object to his/her use of 'dirty language' or calling people 'dirty names'" or say just about every other word he/she uses is a curse word" "Has lost several teeth or has cauliflower ears or broken nose or scars from fighting."

Finally, Factor AC - Hysterical Emotional Lability - is identified by items like "Complains about being too fat or too thin when actually he/she is not" "Says things like 'I'm sorry' or 'I didn't mean it' more than others do." "Asks others to help him/her decide on something or to decide for him/her" "Complains of pain in his/her sex organs (or, for a woman, of severe pains during her period)."

It can be seen from Table 4 that there are distinct patterns for the different diagnostic groups. We have not thoroughly

analyzed the comparisons, partly because we have not developed the standard scores necessary to make direct comparisons. However, by picking out the highest mean factor score in each row of each factor one can get a comparative understanding of which factors prove to be highest scored for which group. Excluding groups 4 and 6 because of their low numbers, look across the means for Factor B where group 3 is significantly higher than the next highest group 5. Other comparisons can be made from the raw score means and standard deviations across the rows for the factors.

Discussion

Instead of detailing the several nuances of meaning which can be gotten from this initial standardization of the AdBCP instrument, including some of the difficulties with the results, it seems better to project into the future what yet needs to be done. A set of behavioral dimensions has been developed for adult emotional disorders. However, further development is necessary. Cross validation and other validity studies will be necessary in order to establish these dimensions as firm ones to be used for classification. Then, applications of cluster-analytic techniques for defining groups or types of persons with specified behavior patterns will have to be carried out. And then, intervention procedures will have to be tried out with different types of individuals to obtain those procedures which are most efficient in dealing with these different types. And finally, procedures will have to be developed for preventing some of these types of individuals from developing. Such a project goes beyond even the lifetime of the younger member authoring this paper.

TABLE 1

SUBJECT TYPES AND SOURCES

	Type and Source	"Self" Respondent	"Other" Respondent	Total
CLINICAL SUBJECTS	Out-Patients			
	Private Practices	76	26	102
	Houston V.A. Hosp.	38	0	38
	Total	114	26	140
	In-Patients			
	Houston V.A. Hosp.			
	Psychiatric Wards	24	0	24
	Alcohol Program	61	0	61
	Palo Alto V.A. Hosp.	17	0	17
	USAF Hosp. San Antonia	7	0	7
	Total	109	0	109
	Clinic Totals	223	26	249
NON-CLINICAL SUBJECTS	College Subjects	180	23	203
	Non-college Subjects	136	27	163
	Non-clinic Totals	316	50	366
	GRAND TOTALS	539	76	615

TABLE 2

SEX, RACE, AGE AND EDUCATIONAL CHARACTERISTICS OF SUBJECTS

		Clinic		Non-Clinic		Total	
SEX	Males	N=182	73%	N=142	39%	N=324	53%
	Females	N= 67	27%	N=224	61%	N=291	47%
RACE	White	n=214	86%	N=329	90%	N=543	88%
	Non-White	N= 35	14%	N= 37	10%	N= 72	12%
AGE		$\bar{X}$=40.11		$\bar{X}$=27.73		$\bar{X}$=32.74	
		Std.Dev.=10.54		Std.Dev.=11.02			
EDUCATION*		$\bar{X}$=3.34		$\bar{X}$=3.27		$\bar{X}$=3.29	

*McGuire-White Index

TABLE 3

INTERPRETED FACTORS

A. General Psychopathology

* B. Aggressive Misanthropic Maladjustment

* C. Positive Social Orientation

* D. Psychoid Organicism, Depression

* E. Hostile Paranoia

* F. Psychosomatic, Organic, and Delusional Anxiety Equivalents

* G. Anorexic Dependency

* H. Disenchanted Parenthood

* I. Apathetic Dependent Psychosis

* J. Cognitive Disorganization

* K. Impulsivity, Negativity, and Confusion

N. Sensory and Psychophysiological Disturbance

* P. Manic Impulsivity

* Q. Pseudopsychopathy

R. External Locus of Control

S. Distorted Body Image

* U. Vegetative Depression

* V. Overt Antisocial Aggression

* W. Grandiosity, Hypochondriacal Delusions, and Overt Psychosis

X. Withdrawn Interpersonal Inadequacy

Z. Simple Regressed Psychosis

*AB. Mixed Psychosis with Depression and Sleep Disturbance

*AC. Hysterical Emotional Liability

*AD. Identity Insecurity

* Indicates scored factors

TABLE 4

FACTOR SCORES BY DIAGNOSTIC GROUP

Factor	DIAGNOSTIC GROUP 1	2	3	4	5	6	7	8	9
B	2.272*	1.158	7.042	8.203	4.173	4.415	1.448	1.446	2.105
	2.600#	1.088	2.324	2.318	2.795	2.309	1.230	1.309	2.395
C	8.847	9.095	8.690	9.557	7.908	8.945	7.241	8.656	9.103
	3.153	3.261	2.764	3.426	2.990	3.295	2.659	3.012	3.079
D	.060	.033	.066	.139	.191	.413	.065	.076	.057
	.211	.113	.151	.173	.488	.927	.171	.149	.225
E	8.340	6.977	10.874	12.919	14.607	16.793	8.835	6.921	8.814
	7.161	5.946	7.537	6.399	10.691	12.307	8.408	4.516	7.516
F	5.770	3.876	8.638	10.076	13.079	16.331	7.742	4.585	7.484
	6.265	3.795	6.901	6.615	9.733	12.054	8.619	3.185	7.485
G	2.010	2.165	1.366	1.880	2.137	1.954	1.991	1.893	1.847
	1.580	1.650	1.282	1.344	1.484	1.758	1.735	1.402	1.358
H	.377	.260	.252	.516	.515	.636	.569	.718	.531
	.373	.354	.286	.399	.288	.348	.240	.325	.427
I	1.606	1.247	2.102	2.130	3.406	3.178	1.546	1.777	1.711
	1.300	.981	1.182	1.157	1.929	2.069	1.164	1.197	1.430
J	.394	.268	.535	.403	1.070	1.700	.467	.309	.417
	.653	.399	.700	.457	1.220	1.879	.872	.386	.633
K	.712	.532	1.097	2.144	1.364	1.510	.659	.624	.760
	.766	.564	.879	.861	1.305	1.380	.656	.465	.763
P	.501	.325	.968	1.060	1.029	1.274	.466	.428	.599
	.795	.502	.930	.810	.983	1.386	.876	.543	.830
Q	.214	.167	.278	.351	.457	.735	.153	.200	.227
	.399	.310	.413	.369	.750	1.080	.297	.342	.389
U	.115	.065	.252	.153	.283	.424	.180	.065	.096
	.256	.167	.349	.192	.445	.606	.316	.159	.241
V	.163	.140	.293	.527	.159	.348	.124	.116	.125
	.246	.229	.287	.424	.225	.407	.171	.164	.258
W	.115	.047	.117	.067	.698	.689	.056	.066	.163
	.434	.149	.320	.178	1.327	.975	.137	.159	.445
AB	.146	.101	.187	.494	.377	.528	.096	.113	.192
	.305	.205	.366	.569	.552	.462	.242	.218	.431
AC	.661	.626	.850	.960	.962	.996	.495	.484	.570
	.481	.439	.480	.409	.646	.564	.514	.404	.477
AD	.184	.164	.218	.043	.314	.333	.212	.150	.187
	.303	.277	.304	.113	.405	.565	.426	.244	.284

* Raw score means. #Raw score standard deviations.

GROUP LEGEND:
1 = Total (N=615)
2 = Nonpsychiatric Controls(N=366)
3 = Alcoholics (N = 73)
4 = Drug Abusers (N = 7)
5=Schizophrenics (N=38)
6=Major Depressives (N=8)
7=Neurotics (N=33)
8=Personality Disorders (N=44)
9 = Psychiatric Subjects with Unknown Diagnosis (N=46)

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